

Attorney Docket No. 370497-320472
U.S. App. No. 10/644,302

In the Claims:

Please amend the claims as follows:

I-10 (cancelled)

11. (new) A device for fractionating a mixture into its various components, wherein the device comprises separation elements mounted in series and in a closed loop, presenting alternating points of injection and points of drawing-off along the series of the separation elements, in which the closed loop is formed by four successive areas each constituted by at least one separation element, this device comprising at least one point of injection of solvent and one point of injection of diluent located between two respective areas, a point of injection of mixture, at least one point of drawing-off of raffinate located upstream of the point of injection of mixture, in the direction of circulation of the solvent, characterized in that:

- the solvent is a supercritical pressurized fluid,
- each of the separation elements is constituted by a membrane phase separation element, wherein each membrane phase separation element comprises a porous membrane,
- it comprises means for injecting the solvent at a pressure greater than its critical pressure, and for maintaining the pressure in said loop at a value above critical pressure,
- it comprises means for injecting the diluent and for maintaining the pressure thereof at a value similar to that of the solvent in each of the areas.

12. (new) The device according to claim 11, characterized in that the separation elements are constituted by a cylindrical envelope containing a bundle of hollow, permeable fibers, disposed along the longitudinal axis of the envelope and fluid inlet and outlet means, so that one of the fluids circulates inside the fibers and the other outside them.

13. (new) The device according to claim 12, characterized in that the fibers are constituted by polypropylene.

Attorney Docket No. 370497-320472
U.S. App. No. 10/644,302

14. (new) The device according to claim 11, characterized in that the respective pressures in each of the areas are such that the solvent power of the solvent in each area is maintained constant and is different from one area to another.

15. (new) The device according to claim 14, characterized in that the solvent power of the solvent decreases in the direction of its flow.

16. (new) The device according to claim 14, characterized in that the enthalpy is maintained constant in all the areas.

17. (new) The device according to claim 14, characterized in that it comprises a pumping system in order to increase the pressure of the diluent between each area, in the direction of flow thereof, and a system for balancing the pressures of the diluent and of the solvent in each of these areas.

18. (new) The device according to claim 17, characterized in that volumetric pumps are used for circulating the diluent at controlled flowrates in each of the respective areas.

19. (new) The device according to claim 17, characterized in that the pressure balancing system is constituted by a balancing recipient associated with each area and which balancing recipients are connected to each of the streams of diluent and of solvent respectively entering and leaving each downstream area, in the direction of circulation of the solvent.

20. (new) The device according to claim 19, characterized in that the interface between the diluent and the solvent is maintained stable by means of a system for measuring the respective levels of the balancing recipients acting on the flowrate regulation of the corresponding pump.